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ABSTRACT

The Department of Industrial Technology Education (ITE) at Indiana State University offers approximately 20 courses per semester, split equally between undergraduate and graduate courses. Although all classes are offered on campus, almost half of the ITE courses are also taught using these three alternative simultaneous delivery methods: (1) for students at remote sites who can integrate live courses into their work schedules, a satellite system is available; (2) for those who work irregular hours and cannot commit to scheduled classes, videotapes are an option; and (3) for those who need even more flexibility, an Internet-based instructional program is available for use at home at any hour of the day. The delivery options were instituted to help novice ITE teachers begin their careers, provide professional development to veteran teachers, increase class sizes, and meet the needs of nontraditional students. Concerns with the newer formats include interaction, higher expertise needed by faculty, assessment, and the extra time needed by faculty to handle more remote students. To address interaction concerns, faculty supplement e-mail and telephone contact with a variety of other options, such as satellite transmission and written reactions via mail, fax, or e-mail. To meet assessment concerns, the course software has a tracking feature that allows instructors to monitor students "hits" on the course site to measure class participation, and to have exams proctored for students at remote sites. Faculty development has also been promoted. (KC)

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Indiana State University's (ISU) School of Technology has five departments: aerospace technology, electronics/computer technology, industrial/mechanical technology, manufacturing/construction technology, and industrial technology education. The Department of Industrial Technology Education (ITE), which employs six full-time faculty, offers bachelor's and master's degrees in human resource development, technology education, and career and technical education. While many of the enrollees in these programs are traditional, full-time students, a growing number are employed professionals and non-traditional learners seeking new skills and knowledge. In the fall of 2000, the ITE had approximately 70 majors in Career and Technical Education. Most of these individuals were high school instructors, technical college instructors or technical trainers in business and industry

The ITE department offers approximately 20 courses per semester, split equally between undergraduate and graduate courses. (Zirkle and Shoemaker, 1999) For students who prefer an emphasis on face-to-face interaction with peers and professors, all classes are offered on campus. But almost half of ITE courses each semester are also taught using three alternative simultaneous delivery methods: for students at remote sites who can accommodate live courses into their work schedules, a satellite system is available. For those who work irregular hours from week to week and cannot commit to scheduled classes, videotapes are a viable option. For those who need even more flexibility, an Internet-based instructional program is available for use at home at any hour of the day. Each course delivery option offers its own advantages; for example, students from out-of-state who take the courses on videotape have their out-of-state tuition waived. Many students experiment with different methods, taking some courses on campus and others via other delivery methods.

There were many reasons for implementation of the multiple delivery methodology. First of all, the university, through conversations with local school districts and the Indiana state department of education, felt the program was needed, both as a way to help novice T&I teachers begin their careers and as a way to provide ongoing professional development to veteran teachers. However, the program was facing enrollment challenges; there simply were not enough students enrolled. Secondly, the university recognized that many potential students were place or time-bound. They were unable to get to campus to meet a traditional class. These non-traditional students had a need for degree programs and/or professional development, but were unable to access it.

Interaction Concerns

With many distance education efforts, ITE faculty have encountered interaction issues, both for the instructor and the students. Lack of face to face contact is a primary concern. With students taking courses in various sites in Indiana, and some located in other states, instructors

and students do not have the opportunity to meet in person.

Limitations on learning activities is another interaction concern. Students taking courses over the Internet may not be able to participate in in-class presentations, role plays or other learning activities that require a physical presence. Group, cooperative activities are limited, as are "hands-on", psychomotor activities, especially for Internet students. Student participation in these types of activities can be severely limited.

Response time to student questions about the class, advising queries, and the grading of assignments is yet another interaction concern. Students at a distance do not have the ability to make an office visit during an instructor's assigned office hours. The receipt and return of distance student assignments can be slower than for those on campus.

Assessment Issues

Related to interaction issues, there are student assessment issues that occur during distance courses. As previously mentioned, feedback response time can be slowed by a lack of timely receipt of assignments from students, coupled with return time on the part of the instructor.

It may be difficult to evaluate participation levels of distance students. How often are they accessing the courses? In what manner are they accessing the courses? Internet students are not physically present, so it may be problematic to determine their level of interaction and participation with the class.

Difficulties in monitoring work ownership is another issue with distance courses. Can instructors be reasonably assured the students are doing their own work? The question of honesty is a common one with distance education programs.

ITE faculty recognized a need to vary assessment types in distance courses. Again, since the students are not on-campus, assessment activities such as student demonstrations are unlikely. There may be an over reliance on essay type tests or research papers as the primary modes of student assessment.

Some Solutions to Interaction and Assessment Concerns

To address interaction concerns, faculty supplement e-mail and telephone contact with a variety of other options: IHETS students can communicate with faculty through satellite transmission, which allows for audio communications. Students taking courses via videotape send written reactions to their instructors via mail, fax, or e-mail on a weekly basis. Internet students utilize email distribution lists, chat rooms, and discussion boards to communicate with faculty and other students. Faculty have also experimented with online "office hours" where students can log on at specified times and talk with the instructor via an office "chat room."

On the assessment side, the course software designed for Internet courses (Blackboard's CourseInfo) has a tracking feature with allows instructors to monitor student "hits" on the course site, and many use this as a measure of class participation With respect to testing, faculty have arranged to have exams proctored for students at remote sites.. Faculty also have developed multiple versions of the same exam and distribute them randomly as a way to discourage the sharing of answers on exams.

Faculty Development

Teaching courses through multiple delivery formats requires a high level of expertise on the part of the faculty. Faculty professional/technical development is a top concern. Most faculty are unfamiliar with the university computer network, which is a mixed Novell and UNIX environment. The ability to create web pages and work with the Internet course software is a necessity. Perhaps most important is the ability to transfer traditional, standard "on-campus" course material to the satellite system and the Internet. These needs, along with others, have created numerous professional development challenges for faculty and the university.

Some Solutions to Faculty Development

Faculty training is imperative. ITE faculty have participated in training sessions to learn how to utilize the various technologies that support multiple delivery platforms. Indiana State University sponsors the Course Transformation Academy (CTA), a development program designed to give faculty members the time and resources they need to investigate, create, and utilize alternative instructional strategies. The CTA offers semester-long paid workshops for groups of 15-20 faculty members, as well as an intensive, one-week summer workshop (Zirkle and Ourand, 1999).

Participants develop hands-on projects in order to learn about creating Internet-based, broadcast, and interactive video courses and about incorporating supplementary technologies—such as videotapes and audio-conferencing—into their instruction. As they work with the technologies, faculty members use asynchronous and synchronous tools to discuss pedagogical issues, course design considerations, and assessment strategies. They receive information about three important subjects: the University's policies on intellectual property and copyright fair use, its distance education student services, and University resources available to assist faculty members in course development and delivery. During the CTA, participants have opportunities to work on aspects of their own courses as they complete projects designed to enhance their technological competencies (Indiana State University Division of Lifelong Learning, 2000).

Indiana State University also has a Faculty Computing Resource Center (FCRC) an interdisciplinary group of professionals, students, artists, and educators, who are experimenting with interactive multimedia technology in professional practice and education (Indiana State University Faculty Computing Resource Center, 2000). It provides various services to faculty, such as consultation and referrals,video editing and production, support with Linux, Windows NT, Windows, DOS, OS/2, and Macintosh OS, as well as limited hardware support. The FCRC also assists with course home page design, online course module development and implementation.

However, much faculty learning is "on-the-job" and from fellow faculty. Faculty share their experiences and ideas, along with new discoveries, many made by trial-and-error, as they work with the multiple delivery format.

Other Issues

All these issues have created other concerns for faculty, not the least of which is the time constraint that is imposed from the multiple delivery modes. While the maximum number of students in an ITE course is generally capped at 40, the number of distance students can easily be

75% of that total (Zirkle and Ourand, 1999). That results in a significant number of emails, phone calls and other requests for information from distance students that do not have immediate classroom access to the instructor. Faculty are given the equivalent of a two-course "load" for each multiple delivery format course they teach. As the programs have grown in popularity, class size continues to be an issue.

Faculty are many times the first point of student contact for technical problems (Zirkle and Ourand, 1999). While technology has certainly allowed the department to deliver the courses, it is not foolproof. Students have periodic problems with the satellite transmission, and many experience difficulties with accessing course sites on the Internet and performing such tasks as live chat or on-line office hours. While the university has established a toll-free technical support line, students still turn to the course instructor for many concerns. This creates yet another time constraint for faculty.

The ITE department is also concerned with issues of quality and consistency. Are all student groups receiving the same quality of instruction? Is there enough interaction for distance students? Do on-campus students get the same exposure to technology that distance students receive? These issues are discussed are discussed on a frequent basis by ITE faculty and will be a focus for future research.

Positive Benefits

The multiple delivery format has produced several positive benefits for students and faculty. The department has experienced increased enrollment; most classes offered by the multiple delivery format in the fall of 2000 were closed due to high enrollment. In the career and technical education area, both preservice and inservice teachers from Indiana and other states have accessed courses for in order to earn degrees, renew teaching certificates/licenses, and for other professional development needs.

Faculty, despite the increased workload, see the multiple delivery format as a professional growth opportunity. It has required them to keep current with the latest instructional technologies and computer hardware/software changes. They have become role models for the use of technology in the classroom. It has also allowed them to "extend their sphere of influence" from beyond the traditional campus. The department now has students from over 10 states. Most believe it has helped strengthen both the content of, and discussion in, classes, as career and technical educators from all over the country now have participated.

The multiple delivery format is the de facto standard in the department – virtually all the courses are delivered in this manner. The department is now able to deliver courses to meet the specific learning needs of their students, no matter where they are located. This has enabled career and technical education professionals to have access to high quality courses for continued professional development.

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